Phelps Dodge Corporation

Loach Minnow and Spikedace Management Plan

Eagle Creek, Arizona

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I. GENERAL BACKGROUND

The loach minnow (*Tiaroga cobitis*) was listed as "threatened" by the United States Fish and Wildlife Service ("FWS") in 1986, following proposed listing in 1985 (FWS, 1986a). The spikedace (*Meda fulgida*) was listed as "threatened" by FWS in 1986, following proposed listing in 1985 (FWS, 1986b). Recovery plans for the species were finalized in 1991 (FWS, 1991a, 1991b). Critical habitat was designated for both species in 1994 and again in 2000. Both designations were invalidated by federal courts. FWS recently proposed critical habitat for these species on Eagle Creek in Arizona.

A. CHARACTERISTICS OF EAGLE CREEK

The headwaters of Eagle Creek are near Robinson Mesa, south of the Mogollon Rim in east-central Arizona, and the stream flows nearly directly south to join the Gila River southwest of Clifton. The segment proposed for critical habitat designation is 45.3 miles (72.9 km) long, extending from the confluence of Dry Prong and East Eagle Creek downstream to a diversion dam (the "Diversion Dam") owned by Phelps Dodge Corporation ("Phelps Dodge"), about 12 river miles (19 km) upstream from the confluence with the Gila River. The Diversion Dam is located in the Southwest Quarter of Section 23, Township 4 South, Range 28 East. Approximately 17.2 miles (27.7 km) of Eagle Creek, upstream of the Diversion Dam and variably within the San Carlos Apache Indian Reservation, has been proposed for exclusion from critical habitat due to the existence of a Fishery Management Plan developed by the Tribe (FWS 2005).

For purposes of this management plan, Eagle Creek upstream of the Diversion Dam can be divided into three segments based on flow characteristics, referred to in this plan as the Upper Reach, the Middle Reach, and the Lower Reach. The Upper Reach, largely within the Apache National Forest, runs from the headwaters to the Gila and Salt River Base Line and is perennial. The Middle Reach is a seasonally intermittent segment of the creek that begins where Eagle Creek enters a broad valley near the Gila and Salt River Base Line and ends at the confluence of Eagle Creek and Willow Creek. The Lower Reach includes those portions of Eagle Creek from Willow Creek downstream to the Diversion Dam. A substantial amount of the surface flows within the Lower Reach

are sustained and augmented by the Phelps Dodge water supply system established in the 1940's.

Phelps Dodge's water supply for the Morenci Mine and the towns of Clifton and Morenci is derived from a variety of water rights (including some contractual water rights) that were perfected to support specific beneficial uses under Arizona law including mining, metallurgical, agricultural, municipal, domestic and other uses. The source of water associated with these rights includes the Black River transfer water (supported by a Central Arizona Project exchange), several deep ground water wells, and surface water from Eagle Creek constituting about six percent of the natural flow. All of these sources are used in a manner consistent with the types of use specified in the associated water rights. Land uses along Eagle Creek include livestock grazing, agriculture, some residential, and recreational uses, including sport fishing, hunting and camping.

B. FISH SURVEY HISTORY OF EAGLE CREEK

Despite intensive annual surveying of Eagle Creek, no loach minnow or spikedace have been detected below Forest Service Road 217, within the Upper Reach, in almost 20 years. Loach minnow were first documented in Eagle Creek by Miller in 1950 in the vicinity of Sheep Wash (70 Fed. Reg. 75,546; Marsh et al., 2003; Marsh et al., 1994). Despite intensive sampling efforts in Eagle Creek throughout the 1970s and early 1980s, no loach minnows were documented in Eagle Creek until 1994 when 10 adults were collected in a riffle near Honeymoon Campground, approximately 12.4 miles (20 km) upstream from the site of Miller's 1950 collection. Subsequent collections at this location in 1995, 1996, and 1997 yielded similar results. All of the collections made in the 1990s were restricted to this extremely localized area of Eagle Creek in the Upper Reach. Marsh reports that suitable loach minnow habitat "extends several kilometers upstream and downstream of the collection site." Despite extensive sampling efforts both upstream and downstream of this location, no other loach minnows were ever collected in Eagle Creek.

Spikedace were not collected anywhere in Eagle Creek during the 1950 survey, but were collected during the latter half of the 1980's at several locations. All fish surveys of Eagle Creek since 1990 have had negative results for spikedace. Spikedace were first recorded in Eagle Creek in 1985 when ten individuals were identified in the Lower Reach at P-Bar Ranch (Marsh et al., 1990). The species was also collected in the Lower Reach in 1987: a total of 59 spikedace were collected between P-Bar Ranch and

the Diversion Dam, and spikedace were identified as present in unspecified numbers at Sycamore Canyon. In 1989, two individuals were collected in the Lower Reach at the gaging station one mile upstream from Sheep Wash. Despite intensive annual monitoring of Eagle Creek, no spikedace have been detected anywhere in Eagle Creek since 1989 (Marsh et al., 1990; Marsh et al., 1994; 70 Fed. Reg. 75,546). Although FWS considers Eagle Creek to be currently occupied by spikedace, the survey record since 1950 indicates that Eagle Creek is not occupied by spikedace.

The Lower Reach of Eagle Creek is dominated by a non-native fishery and is used extensively by the public for sport fishing. Activities not under the control of Phelps Dodge have allowed the establishment of non-native fish in the Lower Reach of Eagle Creek. The Diversion Dam, however, does function as a barrier to non-native fish migration from downstream reaches of Eagle Creek and the Gila River. The intermittent nature of surface flows in the Middle Reach provides a second barrier to non-native fish dispersal, to the benefit of the Upper Reach.

C. PRIMARY CONSTITUENT ELEMENTS

FWS identified several primary constituent elements ("PCE") essential to the conservation of the loach minnow and spikedace (FWS, 2005). The PCE identified by FWS in the proposed critical habitat rule include: (1) permanent, flowing water; (2) sand, gravel, and cobble substrates; (3) pool, riffle, run, and backwater stream components; (4) a natural, unregulated hydrograph that allows for periodic flooding or, if flows are modified or regulated, a hydrograph that allows for adequate river functions, such as flows capable of transporting sediments; and (5) habitat devoid of non-native fish species detrimental to loach minnow and spikedace, or habitat in which detrimental non-native fish are at levels which allow persistence of spikedace (FWS, 2005). Phelps Dodge has reviewed these PCE in the context of the proposed critical habitat designation and has submitted comments to FWS (Fennemore Craig, 2006). Phelps Dodge's comments are incorporated herein by reference.

II. MANAGEMENT PLAN

Although Phelps Dodge believes the stretch of Eagle Creek south of the Gila and Salt River Base Line is unoccupied by loach minnow and spikedace, does not require special management for these species, is otherwise unsuitable for designation as critical habitat and the benefits of excluding outweigh the benefits of including this reach, Phelps Dodge will implement the following management plan for the Lower and Middle

Reaches of Eagle Creek where Phelps Dodge owns riparian lands ("Phelps Dodge Reach"). Lands along the Phelps Dodge Reach subject to this management plan are depicted in Figure 1. The goals of this management plan include:

- monitoring the distribution and abundance of the loach minnow and spikedace in Eagle Creek passing through the Phelps Dodge Reach;
- obtaining an understanding of the population dynamics of the loach minnow and spikedace as they relate to existing habitat conditions and land use practices in Eagle Creek passing through the Phelps Dodge Reach;
- continuing historic land use practices and water supply practices which enhance water flows in the Phelps Dodge Reach, and consideration of loach minnow and spikedace habitat when deviating from such historic management practices.

Phelps Dodge believes the implementation of the management activities and future coordination with FWS discussed below negates the need, if any, for special management considerations or protection within the Phelps Dodge Reach. In addition, Phelps Dodge believes this management plan results in the following benefits that might not otherwise occur: (1) the formation of working relationships to promote the conservation of the loach minnow and spikedace and their habitat; (2) the opportunity for collaboration and cooperation on loach minnow and spikedace management and other resources of interest to the Federal government; and (3) conservation benefits to riparian ecosystems, including habitat that may be or may potentially become suitable to loach minnow and spikedace.

A. MANAGEMENT OF EAGLE CREEK WATER SYSTEM

Ensuring perennial flows for the loach minnow and spikedace has been identified as a critical component to their recovery (FWS, 1991a, 1991b, 2005). As stated by FWS, the loach minnow and spikedace "cannot exist in dewatered places, and populations can be expected to decline or disappear from stream reaches which are intermittent or ephemeral" (FWS, 1991a, 1991b). Moreover, "[p]ermanence of flows of sufficient quantity and quality must be assured to maintain integrity of spikedace [and loach minnow] populations and their habitats" (FWS, 1991a, 1991b).

Phelps Dodge's water system on Eagle Creek has been developed and maintained to provide a dependable and adequate water source for Phelps Dodge mining operations, including domestic water for the towns of Morenci and Clifton, and has, in effect, provided perennial flow in Eagle Creek below the confluence of Willow Creek since the

1940's. FWS previously recognized the benefits of augmented flows by Phelps Dodge to loach minnow and spikedace habitat: "The artificial augmentation of Eagle Creek flows may help mitigate other habitat alterations that have decreased natural flows in the system, thus resulting in a system that is more 'natural' than it would be without the artificial augmentation" (FWS, 2000).

It is important to note that while maintaining flows is beneficial to Phelps Dodge and to the Lower Reach of Eagle Creek, it is possible that operational requirements of the Morenci Mine will require short term (weeks to months in duration) reduction or elimination of pumping and diversion activities. Further, at some unknown date in the future, active mining will cease at Morenci and the interbasin transfer and pumping of ground water may no longer be necessary or economically practical to sustain. Nothing in this management plan will impair Phelps Dodge's ability to hold, exercise or modify its water rights and associated uses of water as it deems necessary under the circumstances.

Phelps Dodge's goal in implementing this management plan is to operate its Eagle Creek water system to maintain perennial flows in Eagle Creek, which are important for loach minnow and spikedace habitat, from the confluence of Willow Creek to the Diversion Dam to the extent it is legally, economically, and hydrologically reasonable to do so. These operations historically have enhanced water flows in the Lower Reach of Eagle Creek while allowing for periodic flooding and other river functions such as sediment transport and the maintenance of sand, gravel, and cobble substrates. Phelps Dodge will also maintain its Diversion Dam on Eagle Creek, which is known to prevent the mass migration of non-natives from downstream into Eagle Creek above the Diversion Dam, to the extent it is legally, economically, and practically reasonable to do so. These management practices are expected to promote and maintain the integrity of loach minnow and spikedace habitat within the Phelps Dodge Reach of Eagle Creek.

The principal threat to loach minnow and spikedace habitat in the Phelps Dodge Reach is the presence of non-native fish. This threat was also addressed by the Fisheries Management Plan submitted by the San Carlos Apache Indian Tribe to FWS. The Fisheries Management Plan submitted by the Tribe and relied on by FWS to exclude the portions of Eagle Creek within the Reservation will, according to FWS, "conserve, enhance, and restore spikedace and loach minnow habitat, including efforts to eliminate nonnative fishes from spikedace and loach minnow habitat" (FWS, 2005). The activities outlined in this plan are complimentary to the measures proposed by the Tribe.

B. MONITORING AND RESEARCH SUPPORTED BY PHELPS DODGE

Phelps Dodge has supported various biological surveys and studies on Eagle Creek. For example, the surveys and studies of loach minnow and spikedace populations on Phelps Dodge property by Paul Marsh, et al., in Eagle Creek have been ongoing for many years. The focus of those studies has included the reach south of the San Carlos Apache Reservation to below Phelps Dodge's pump station on Eagle Creek. Phelps Dodge will continue participating in such research projects on Eagle Creek in the future.

The Rocky Mountain Research Station ("RMRS"), a division of the United States Forest Service, is conducting a study in cooperation with Phelps Dodge to analyze the ecology of the loach minnow and spikedace and their habitat in Mangas Creek and the Gila River in New Mexico and other selected streams and rivers in Arizona (RMRS, 2006). This project is expected to yield information regarding native fish habitat selection and the influence of land uses and management practices on native fish and their habitat.

C. COORDINATION WITH FWS

Phelps Dodge will coordinate with FWS regarding the management activities in the Phelps Dodge Reach of Eagle Creek contemplated by this plan. Such coordination will include:

(1) Phelps Dodge will provide an annual summary to FWS regarding its implementation of this plan. This summary will provide a brief narrative statement affirming implementation of the plan elements over the previous year and noting any deviations. This summary will also provide a brief narrative statement affirming anticipated implementation of the plan for the upcoming year and noting any anticipated deviations. The summary for each calendar year will be provided to FWS during the first quarter of the next calendar year.

(2) Phelps Dodge will make reasonable efforts to provide FWS with notice of any significant changes to the management of its water supply system that are outside the range of historic operating parameters discussed in this plan. When making such changes, Phelps Dodge will consider loach minnow and spikedace habitat and any comments received from FWS, and will make reasonable efforts to minimize adverse impacts to loach minnow and spikedace habitat to the extent legally, economically, and practically reasonable under the circumstances. However, nothing in this management plan will

impair Phelps Dodge's ability to hold, exercise or modify its water rights in its sole discretion.

(3) Phelps Dodge (or its designated representative) will make reasonable efforts to coordinate its water management activities by attending regularly scheduled fisheries management working group meetings to stay abreast of ongoing management issues and concerns that may affect Phelps Dodge management activities contemplated by this management plan.

(4) Phelps Dodge recognizes FWS currently has no plans to renovate any portion of Eagle Creek, but may decide to pursue such projects in the future. Phelps Dodge believes that attempts to renovate Eagle Creek will face significant regulatory, political, social, recreational, and logistical barriers. Nevertheless, Phelps Dodge will consider stream renovation projects for Eagle Creek should FWS decide to pursue them, provided that such projects do not interfere with existing land and water uses and rights.

III. CONCLUSION

Phelps Dodge's historic management of its resources in the Phelps Dodge Reach of Eagle Creek has promoted permanent and flowing water while allowing for periodic flooding and other river functions in the Lower Reach. As discussed above, Phelps Dodge will continue to manage its resources consistent with these historic operations to the extent legally, economically, and practically reasonable under the circumstances. In addition, Phelps Dodge will make reasonable efforts to coordinate with FWS and other stakeholders in the watershed. Phelps Dodge will also continue its cooperative efforts with RMRS, FWS, and others to monitor and analyze the habitat of the loach minnow and spikedace in Eagle Creek in the future.

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